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| 10/816,915      | 04/05/2004  | Shuichi Takeuchi     | 1777.1002           | 2620             |

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EXAMINER

EDMONDSON, LYNNE RENEE

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1725

DATE MAILED: 04/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/816,915

Applicant(s)

TAKEUCHI ET AL.

Examiner

Lynne Edmondson

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1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: The phrase "solder bumps" appears throughout the specification. These are presumed to be solder bumps.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 6 contains a limitation that the solder bumps are "area-arranged" on a surface of the electronic part. Solder bumps are typically placed in an array or predetermined configuration. It is not clear what this arrangement is intended to encompass. As the disclosure does not further clarify it, for examination purposes this will be considered a conventional arrangement.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Higashi et al. (USPN 6193136 B1).

Higashi teaches a method of mounting an electronic part comprising the steps of applying a flux-fill including fillers on a surface of a board, connecting solder bumps of the electronic part with the electrodes, simultaneously filling a gap between the part and the board with flux-fill, applying ultrasonic energy to connect the bumps and heating the flux-fill to solidify (figure 1, col 4 lines 26-33, col 5 lines 15-60 and col 6 lines 46-59).

6. Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Gonzalez et al. (US 2003/0080437 A1).

Gonzalez teaches a method of mounting an electronic part comprising the steps of applying a flux-fill on a surface of a board (figure 5), connecting solder bumps of the electronic part with the electrodes, simultaneously filling a gap between the part and the board with flux-fill, applying ultrasonic energy to connect the bumps and heating the

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flux-fill to solidify (figures 6, 8A, 8B, paragraphs 18 and 19). The flux-fill comprises resin, a hardening agent, a hardening accelerator (paragraphs 19 and 45-47), organic acid flux (paragraph 46) and fillers (paragraphs 38-44).

7. Claims 1, 2 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Baba et al. (USPN 6437450 B1).

Baba teaches a method of mounting an electronic part comprising the steps of applying a flux-fill on a surface of a board, connecting area arranged solder bumps (figure 37B) of the electronic part with the electrodes, simultaneously filling a gap between the part and the board with flux-fill, applying ultrasonic energy to connect the bumps and heating the flux-fill to solidify. The flux-fill comprises resin, a hardening agent, a hardening accelerator and organic acid flux (col 7 line 18 – col 8 line 8 and col 14 lines 14-48).

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi et al. (USPN 6193136 B1) in view of Zhou et al. (USPN 5985043).

Higashi teaches a method of mounting an electronic part comprising the steps of applying a flux-fill including fillers on a surface of a board, connecting solder bumps of the electronic part with the electrodes, simultaneously filling a gap between the part and the board with flux-fill, applying ultrasonic energy to connect the bumps and heating the flux-fill to solidify (figure 1, col 4 lines 26-33, col 5 lines 15-60 and col 6 lines 46-59). However the flux-fill is not further disclosed.

Zhou teaches a flux-fill comprising resin, a hardening agent, a hardening accelerator (col 14 lines 50-60), organic acid flux and fillers (col 3 lines 51-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ a filler with resin, hardening agent, hardening accelerator, organic acid flux and fillers to provide a secure, corrosion free bond in a short time period.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baba et al. (USPN 6437450 B1) in view of Zhou et al. (USPN 5985043).

Baba teaches a method of mounting an electronic part comprising the steps of applying a flux-fill on a surface of a board, connecting area arranged solder bumps (figure 37B) of the electronic part with the electrodes, simultaneously filling a gap between the part and the board with flux-fill, applying ultrasonic energy to connect the bumps and heating the flux-fill to solidify. The flux-fill comprises resin, a hardening agent, a hardening accelerator and organic acid flux (col 7 line 18 – col 8 line 8 and col 14 lines 14-48). However there is no disclosure of filler.

Zhou teaches a flux-fill comprising resin, a hardening agent, a hardening accelerator (col 14 lines 50-60), organic acid flux and fillers (col 3 lines 51-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ a filler in combination with the conventional flux-fill materials to provide insulation (Baba, col 3 lines 40-45) as well as a secure, corrosion free bond.

### ***Response to Arguments***

11. Regarding applicant's argument that claim 1 now calls for the bumps being area-arranged, as there is no clarification for this arrangement, the arrangement is presumed to be a conventional arrangement such as a ball grid array or line of bumps. All of the prior art teaches such conventional arrangements. Figure 10 of Higashi shows the bumps in an area array. Figure 5 of Gonzalez shows the bumps (112) in an area arrangement. Higashi and Gonzalez additionally teach application of ultrasonic vibrations.

12. Therefore the 102 rejection of claims 1-4 as anticipated by Higashi stands.

13. Therefore the 102 rejection of claims 1-5 as anticipated by Gonzalez stands.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Toshiba (JPN 11-288975 A, IDS), Kajiwara et al. (USPN

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6798072 B2), Chen et al. (US 2004/0261904 A1), Yamaguchi et al.(USPN 6613449 B2) and Chan et al. (US 2002/0090754 A1).

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (571) 272-1172. The examiner can normally be reached on Monday through Thursday from 6:30 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lynne Edmondson  
Primary Examiner  
Art Unit 1725

*CLB*  
*4/13/06*

LRE